DOCUMENT RESUME

ED 200 931 CS 006 024

AUTHOR Wilcox, Wayne C.; And Others
TITLE Isolation of Generality Statements and Instances.
SPONS AGENCY National Science Foundation, Washington, D.C.
PUB DATE Feb 78
GRANT NSF-SED-76-1650
NOTE 12p.

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Advance Organizers; College Students; *Content Area Reading; Higher Education; *Reading Research; *Recall (Psychology); Retention (Psychology)

ABSTRACT

An experiment was conducted to test the effects of isolating and identifying generalities and instances in written prose instruction on student performance. Eighty college students were given either a typical chapter from a college textbook that included a summary, the same chapter with the summary removed, a modified version of the chapter in which generalities and instances of those generalities were isolated and irrelevant material was eliminated, or no instruction. Isolating generalities improved performance on a 20-item memory and application level test. Isolating generalities and instances bettered efficiency, which was defined as test score divided by time spent. An unexpected interaction between treatment and the sex of subject occurred. Males exposed to the chapter with the summary had higher test scores than males exposed to the modified chapter. These results were reversed for females. The results provided support for the proposition that instruction designed to teach a given generality should be structured by isolating and identifying descriptive statements and instances of that generality. (Author/RL)

**********
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
**********

U.S. DEPARTMENT OF EDUCATION
NATIONAL INSTITUTE OF EDUCATION
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
X This document has been reproduced as received from the person or organization originating it.
☐ Minor changes have been made to improve reproduction quality.
• Points of view or opinions stated in this document do not necessarily represent official NIE position or policy.

ED200931

# Isolation of Generality Statements and Instances[1]

Wayne C. Wilcox

Joseph C. McLachlan

M. David Merrill

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY
Wayne C. Wilcox
TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

February, 1978

[1]This research was supported in part by Grant No. SED 76-1650 from the National Science Foundation.

CS006024

# Isolation of Generality Statements and Instances

The purpose of this experiment was to test the effects of isolating and identifying expository generalities and instances on student performance.

Merrill and Wood (1976) developed a taxonomy of instructional variables which divides instructional content into four primary presentation forms. One form, an expository generality, is a descriptive statement which does one of three things: first, it may identify critical attributes of a concept and indicate how these attributes are combined; second, it may specify various interrelationships between concepts; and third, it may present procedures for ordering and using concepts.

A second primary presentation form, an expository instance, is a particular object, event, or symbol which is an example of a concept, a relationship between concepts, or a procedure for using concepts (Merrill and Wood, 1976).

Merrill, Olsen and Coldeway (1976) proposed eight relationships between the variables described in Merrill and Wood's taxonomy and student performance. One of these propositions stated that, "The primary presentation forms for a given segment of instruction and accompanying elaboration should be identified and isolated in such a way that a student can easily locate, skip, or review a given form" (p. 11). No studies were found by Merrill and his associates which directly investigated this proposition.

generalities in the modified chapter would focus attention on the main ideas and function as organizers. Several studies have found that isolated verbal organizers help to improve comprehension and retention of fairly long prose passages (Ausubel, 1960; Ausubel & Fitzgerald, 1961; Ausubel & Fitzgerald, 1962; Ausubel & Youssef, 1963; Frase, 1967; Bauman, Glass, & Harrington, 1969; Schnell, 1972). Second, there would be less interference because nearly all the information in the modified chapter which did not pertain to the expository generalities was removed. Third, expository instances were isolated and clearly grouped with the expository generalities they exemplified. This would reduce ambiguity as to which instances belonged to which generalities. Fourth, the isolated generalities along with their instances would enable subjects to easily skip or review those portions of the chapter with which they were most or least familiar. Fifth, each expository generality and instance in the modified chapter was meaningfully labeled. Fredrick and Klausmeier (1968) observed that when meaningful labels were attached to instances concept attainment was better than when nonsense labels were attached to those instances. Therefore, it was thought that meaningful labels attached to instances of the modified chapter would assist learning.

Those in the summary group were given a concluding list of expository generalities which summarized the chapter's content. This set of generalities was expected to facilitate learning by focusing attention and by acting as an organizer. Unlike the modified chapter, however, the original chapter with the summary did not group together

group will be significantly more efficient than students in either the summary or no summary groups.

The usual finding is that the more time spent in learning, the higher the performance on the test. Consequently, when test scores are adjusted for time required to learn, efficiency is often equal even when one group performs better on the test. In this experiment, both less time and superior test performance are predicted. Thus, there should be a difference in efficiency.

## Method

### Students

Eighty students (28 males and 52 females) volunteered to participate in this study. All of the students were enrolled in introductory psychology classes at Brigham Young University.

### Materials

Three types of instructional booklets were prepared using the entire second chapter of Elementary Principles of Behavior (Whaley & Malott, 1971), a best selling psychology textbook. The general topics covered by this chapter included operant conditioning, reinforcement, and response classes.

### Treatments

The summary booklet consisted of the chapter exactly as it appears in the text. The chapter included a summary section at the end which listed the important generalities covered in the chapter.

The no summary booklet was identical to the summary booklet except that the final summary section was excluded.

---

Insert Figures 2 and 3 about here

---

## Procedure

Students were randomly assigned to the four treatment conditions as they entered a scheduled classroom. Each student was directed to be quiet, to fill out the information sheet, and to follow the written directions on the first page of the instruction booklet or the first page of the test booklet if the student was in the control group.

Instructional booklet directions asked the students to study the entire booklet for as long as desired, to mark the beginning and ending times to the nearest minute in the proper blanks by referring to the clock in the room, and to go on to the test booklet when they were finished. It also explained that the content would be tested.

The test booklet directions asked the students to circle the response which they thought was most correct from one of the five possible responses for each item. Students were also directed to take as long as they wanted, to record starting and ending times, and to not look back at the instructional booklets during the test.

After completing the tests, students were directed to leave quietly and to hand their materials to the experimenter at the door.

## Results

A separate analysis of variance for each dependent variable was performed. When significant differences were found, a Newman-Keuls (N-K) procedure was followed to make group comparisons. The

The fourth hypothesis was supported, $F(2,54) = 6.26$, $p < .01$. The N-K test showed that the isolation group was significantly more efficient than the summary or no summary groups which did not differ from each other. In Table 1, remember that the smaller logarithm transformed scores are the more efficient.

Sex Differences

The data indicated that there were some sex differences. Because blocking on sex was not part of the original design, the cell sizes were unequal. Table 1 indicates the means and totals for males and females.

On test performance, there was not a main effect for sex, but there was a sex X treatment interaction as shown in Figure 4, $F(3,72) = 4.02$, $p < .05$.

For time to learn, there were no significant sex differences.

For time on test, females completed the test faster than males $F(1,72) = 6.76$, $p < .01$.

For efficiency, while the means suggested a sex X treatment interaction, neither the main effect for sex nor the interaction was significant.

---

Insert Figure 4 about here

---

## Discussion

Test scores were improved by isolating generalities. Had the males done as well as the females on the modified material, it would be clear that the isolation and summary treatments raised performance over that of the no summary and control treatments.

have been interesting to have measured the feelings of subjects toward the various treatment materials.

Also, it would have been valuable to have measured the learning of incidental information not directly related to the selected generalities. However, in this experiment, only the learning of the generalities isolated in the modified chapter was measured in the posttest. These particular generalities may not have been the most important and inclusive generalities in the chapter. Nevertheless, the chosen generalities, while perhaps not being the most important, were imbedded in the original chapter without the summary. The results of this experiment provide support for the proposition that instruction designed to teach a given generality should be structured by isolating and identifying descriptive statements and instances of that generality.

Merrill, M. D., & Wood, N. D. Instructional strategies: A preliminary taxonomy (Tech. Rep. No. 1R). Orem, Ut.: Courseware, Inc., May 1976.

Schnell, T. R. The effect of organizers on reading comprehension of community college freshmen. Journal of Reading Behavior, 1972-73, 5, 169-176.

Whaley, D. L., & Malott, R. W. Elementary Principles of Behavior. Englewood Cliffs, N. J.: Prentice-Hall, 1971.

## Figure Captions

Figure 1. Fourth page of the modified (isolation) booklet.

Figure 2. One of the application level test items.

Figure 3. One of the recognition memory level test items.

Figure 4. Sex X treatment interaction on test performance.

What is the positive reinforcer in each of these three passages?

Passage 1

The family was delighted with their newly acquired dog named Caesar. He performed numerous tricks such as rolling over, jumping, playing dead, and barking. All family members had to do was provide the appropriate signals and commands. It was decided that Caesar should be rewarded when he did a trick. After all, he did them so well. Each time Caesar completed a trick, he was given his favorite ball to play with. Of course, Caesar still faithfully performed the tricks as he had always done.

15. a. favorite ball
    b. signals
    c. food
    d. pats on the head
    e. there is no positive reinforcement

COURSEWARE INSTRUCTIONAL RESEARCH REPORTS

No. 60 The Structure of Subject Matter Content and Its Instructional Design Implications, Charles M. Reigeluth, M. David Merrill, and C. Victor Bunderson June 1977.

No. 61 Pre-Instructional Directions in a Learner Controlled Environment, Joseph C. McLachlan, Renata V. Schmidt and M. David Merrill, October 1977.

No. 62 Framework Rule Representation and Elaborated Feedback in Statistics Instruction, Norman D. Wood and M. David Merrill.

No. 63 Test and Generality Consistency in a Statistics Classification Task, Renata V. Schmidt, Norman D. Wood and M. David Merrill.

No. 64 Validation of the Instructional Strategy Diagnostic Profile in Physics 100, M. David Merrill, Renata V. Schmidt, Robert F. Norton.

No. 65 Empirical Validation of Selected Instructional Strategy Diagnostic Profile Prescriptions, M. David Merrill, Norman D. Wood, Meryl Baker, John A. Ellis and Wallace H. Wulfeck II, September 1977.

No. 66 Isolation of Generality Statements and Instances, Wayne C. Wilcox, Joseph C. McLachlan and M. David Merrill, July 1977.

No. 67 A Methodology for Investigating the Interactions of Individual Differences and Subject Matter Characteristics with Instructional Methods, Charles M. Reigeluth, February 1978.